NOTES

WE refer elsewhere to the opening of the Colonial and Indian Exhibition on Tuesday. It argues ill for the spirit in which this Show is to be conducted that the representatives of British science, on which the progress of England beyond the seas has so largely depended in the past and must depend in the future, were so conspicuous by their absence at the opening ceremony. Not even the President of the Royal Society was invited to be present, though tickets were liberally distributed to a large number whose prior claims we do not care to discuss.

SCIENCE was well represented by the President of the Royal Society at the Royal Academy dinner on Saturday. Prof. Stokes showed how in several ways science is capable of rendering service to art. The rules of perspective, he pointed out, involved clear geometrical conceptions; while a knowledge of chemistry and physics would keep the artist often from violating nature. Prof. Stokes illustrated the point by referring to the inverted rainbow picture, adduced as an example for a similar purpose in these pages some years ago. At the same time he admitted with justice that art was not without its uses to science. Especially useful was it, he pointed out, as a refreshing and invigorating change for the mind of the scientific student, apt to get clogged and dulled by too eager direction to one particular subject.

THE Fifty-sixth Annual Meeting of the British Association will commence at Birmingham on Wednesday, September 1, 1886. The President-elect is Sir William Dawson, C.M.G., F.R.S., Principal of McGill College, Montreal, Canada. Vice-Presidents: The Right Hon. the Earl of Bradford, Lord-Lieutenant of Shropshire, the Right Hon. Lord Leigh, Lord-Lieutenant of Warwickshire, the Right Hon. Lord Norton, K.C.M.G., the Right Hon. Lord Wrottesley, Lord-Lieutenant of Staffordshire, the Right Rev. the Lord Bishop of Worcester, Thomas Martineau, Mayor of Birmingham, Prof. G. G. Stokes, Pres.R.S. (nominated by the Council), Prof. W. A. Tilden, F.R.S., Rev. A. R. Vardy, Rev. H. W. Watson, F.R.S. General Treasurer: Prof. A. W. Williamson, F.R.S., V.P.C.S., University College, London, W.C. General Secretaries: Capt. Douglas Galton, C.B., F.R.S., A. G. Vernon Harcourt, F.R.S. Secretary: Arthur T. Atchison. Local Secretaries for the Meeting at Birmingham: J. Barham Karslake, Rev. H. W. Crosskey, Charles J. Hart, Council House, Birmingham. Local Treasurer for the Meeting at Birmingham: J. D. Goodman. The Sections are the following:—A. Mathematical and Physical Science—President: Prof. G. H. Darwin, F.R.S.; Vice-Presidents: Donald MacAlister, M.D.; Rev. H. W. Watson, F.R.S.; Secretaries: R. E. Baynes (Recorder), R. T. Glazebrook, F.R.S., Prof. J. H. Poynting, W. N. Shaw. B. Chemical Science—President: William Crookes, F.R.S.; Vice-Presidents: Prof. Carnelly, W. H. Perkin, F.R.S.; Secretaries: Prof. P. Phillips Bedson (Recorder), H. B. Dixon, F.C.S., H. Forster Morley, D.Sc., F.C.S., W. W. J. Nicol, Ph.D., C. J. Woodward, B.Sc. C. Geology—President: Prof. T. G. Bonney, F.R.S.; Vice-Presidents: Prof. C. Lapworth, F.G.S., H. Woodward, LL.D., F.R.S., F.G.S.; Secretaries: W. Jerome Harrison, F.G.S., J. J. H. Teall, F.G.S., W. Topley, F.G.S. (Recorder), W. W. Watts, F.G.S. D. Biology—President: William Carruthers, F.R.S., F.L.S.; Vice-Presidents: Prof. E. A. Schäfer, F.R.S., M.R.C.S., P. L. Sclater, F.R.S., F.L.S., Sec.Z.S.; Secretaries: Prof. T. W. Bridge, Walter Heape (Recorder), Prof. W. Hillhouse, W. L. Sclater, F.Z.S., H. Marshall Ward. E. Geography—President: Major-General Sir F. J. Goldsmid, K.C.S.I., C.B., F.R.G.S.; Vice-Presidents: Major-General Sir Lewis Pelly, K.C.B., K.C.S.I., M.P., F.R.G.S., Capt. W. J. L. Wharton, R.N., F.R.G.S.; Secretaries: F. T. S. Houghton, J. S. Keltie, F.R.G.S., J. S. O'Halloran, F.R.G.S., E. G. Ravenstein, F.R.G.S. (Recorder). F. Economic Science and Statistics—President: John Biddulph Martin, F.S.S.; Vice-Presidents: G. W. Hastings, M.P., F.S.S., Sir R. Temple, Bart., G.C.S.I., M.P., F.R.G.S., F.S.S.; Secretaries: E. F. Barham, Rev. W. Cunningham (Recorder), Prof. Foxwell, F.S.S., J. F. Moss, F.R.G.S. G. Mechanical Science—President: Sir James N. Douglass, M.Inst.C.E.; Vice-Presidents: W. Anderson, M.Inst.C.E.; W. P. Marshall, M.Inst.C.E.; Secretaries: Conrad W. Cooke, J. Kenward, Assoc.Inst.C.E., E. Rigg (Recorder). H. Anthropology—President: Sir George Campbell, K.C.S.I., M.P.; Vice-Presidents: Prof. W. Boyd Dawkins, F.R.S., Lieut.-Col. H. H. Godwin-Austen, F.R.S.; Secretaries: G. W. Bloxam, F.L.S. (Recorder); J. G. Garson, M.D., M.A.I., Walter Hurst, B.Sc., R. Saundby, M.D. The first General Meeting will be held on Wednesday, September 1, at 8 p.m. precisely, when the Right Hon. Sir Lyon Playfair, K.C.B., M.P., F.R.SS.L. and E., will resign the chair, and Principal Sir William Dawson, C.M.G., F.R.S., President-elect, will assume the Presidency, and deliver an address. On Thursday evening, September 2, at 8 p.m., a *soirée*; on Friday evening, September 3, at 8.30 p.m., a discourse on "The Sense of Hearing," by Prof. William Rutherford, F.R.S.; on Monday evening, September 6, at 8.30 p.m., a discourse on "Soap Bubbles," by A. W. Rücker, F.R.S.; on Tuesday evening, September 7, at 8 p.m., a *soirée*; on Wednesday, September 8, the concluding General Meeting will be held at 2.30 p.m.

THE first general meeting of the Congress of French scientific societies took place in the large hall of the Sorbonne on April 27 at noon. M. Bertrand, Director of the Archæological Museum of St. Germain was in the chair. For the first time a special section has been created for geography, of which M. Bouquet de la Grye is chairman. The section of sciences was presided over by M. Faye, and divided into several sub-sections. M. Lhoste presented a pointed cask, with the assistance of which he hopes to keep a balloon floating in the air for several days over the sea. M. Certes, President of the Zoological Society of France, explained the use of colouring matters for the histological and physiological exhibition of living animalcules. The meetings were concluded on Saturday, May 1, by an address by M. Goblet, the Minister of Public Instruction, in which he advocated the establishment of a secondary education from which Greek and Latin should be excluded, their place being filled by modern languages. A number of decorations were awarded to members of learned societies and academies. M. Berthelot was created "Grand Officier" of the Légion d'Honneur.

THE Department of Modern Ethnography in the British Museum being now arranged, the work of arranging the prehistoric section is being taken in hand by Mr. Franks. The three rooms immediately at the head of the western staircase, near the entrance, are devoted to this purpose. The collection will contain the Christy and Museum collections, which will be incorporated with each other, and also the Greenwell collection from British Barrows. The central room of the three will contain palæolithic objects from England and the rest of the world. The finds in the caves of the Dordogne will form an important and interesting part of these. These caves were excavated by the late Mr. Christy at his own expense, and the results added to his collection. The pictures were, at his wish, sent to France. The room on the left of the entrance contains Neolithic objects, arranged under the Stone and Bronze Ages, the objects from the various countries being arranged within the periods. Here Canon Greenwell's remarkable collection from the British Barrows (which will be maintained intact) will find a place. The special value of this collection is that the place and manner of finding of each individual object is known and recorded, and every circumstance connected with the discovery of each is known. The Barrows, from which the collection was made, are found mostly in Yorkshire, although other places are also represented. In the same room will also be placed the implements used in working flint quarries in prehistoric times, and other objects found there; there will also be some curious implements from countries where the Stone Age still exists, as it does, in a certain measure, in Madeira, Syria, and Iceland. The room on the right will be given up to iron objects, and those of an age which may be called semi-prehistoric, such as the Roman times in Britain.

A SUPERFICIAL examination of the ethnographical galleries in the British Museum shows that the American section is overcrowded. On the left are the American antiquities, which are of the greatest interest, but which do not seem to belong properly to ethnography at all, while the objects on the left, belonging to modern America, and which are certainly ethnographical, are crowded into a space which is quite insufficient. As much has been done as possible to arrange the objects, and there is no confusion, but it is quite impossible to examine the cases properly when they contain so much. Ancient Mexico, Peru, and New Granada crowd modern South, North-West, and Arctic America into a very small space. It is obvious that an attempt should be made to remove the American antiquities to some more suitable place, and to give up the whole of the gallery to American ethnography proper.

AFRICA does not seem so well represented in the Collection as it might be for a country which has sent its missionaries and travellers into every corner of the land. Two or three small South Sea Islands occupy about as much space as the continent of Africa. The only district well represented is that of the Upper Nile, the collection of Lupton Bey being specially noteworthy, as giving one a fair idea of the manufacturing industries of the people of these parts. South Africa is moderately well represented, and in a less degree northern West Africa. East Africa, Central Africa, and southern West Africa are all relegated to a small case and very poorly represented. A spear from one tribe lies beside a pipe or a dagger from another tribe a thousand miles distant. And yet in this enormous region there are tribes singularly expert as blacksmiths, potters, &c. No African tribe produces more beautiful spears than the Wa-Vira, more horridly barbed than those of Nyassa, or more remarkable than those of Maryema or of Masai-land; and yet good collections of all these are undoubtedly in the country. Owing to this meagre display the collection is not of much value for purposes of comparison or to illustrate the relative advancement of the various tribes in arts and manufactures, and yet in this respect there is as much difference between the most degraded of the tribes and the most civilised as there is between the latter and ourselves. The arrangement also leaves much to be desired. Articles manufactured by tribes totally distinct in race, degree of civilisation, and religion are thrown indiscriminately together. Take, for instance, northern West Africa. There one finds the fetishes, idols, and rudely-worked articles of the degraded and barbarous tribes of the Lower Niger figuring amongst the artistic and advanced productions of the Mohammedan and polished tribes of the Central Sudan, and nothing to indicate that they are not the work of one people. In the East African section, again, you find Somali weapons beside those of the Bantu tribes further south, such as the Wa-gogo. Some objects do not appear to be correctly named. Thus the backbone of a shield divested of the hide which it was intended to support now figures as a bow, a string having been stretched from point to point. The map to illustrate Africa is scarcely worthy of the British Museum. The Congo Basin is strikingly shown by an utter blank.

FROM the Royal Gardens, Kew, we have received a cheap, carefully arranged, and highly useful guide to Museum No. III. at that establishment, which is devoted chiefly to specimens of timber and other large articles unsuited for exhibition in the glazed cases of the other museum. Another extremely useful publication is a Route Map of the Royal Botanic Garden and Arboretum on a scale quite large enough to enable any visitor to find his way. The various sections of the gardens are clearly laid down, and on the back is an index to the various entrances, museums, houses, the arboretum, &c., corresponding to the sections in the map indicated by figures and letters.

A MICROSCOPICAL SOCIETY has been started in Glasgow with Dr. Dallinger as first President; over fifty members have been enrolled.

THE volcano of Smeru in Java is stated to be in eruption.

WE have received the first number of *The Indian Engineer*, published by Messrs. Newman and Co., Limited, Calcutta. This is a new publication, the object being to provide a representative organ for all branches of the Indian engineering profession, and to make it a creditable representative of the great engineering and scientific services of the country. The leading article appropriately gives a history of Indian engineering journalism. We are told that the first publication of the kind was made by the Corps of the Madras Engineers in the form of a series of papers, to provide a record of the experience of their members for future reference. Messrs. Newman and Co., twenty-eight years ago, followed this first attempt by publishing a paper called *The Engineers' Journal and Railway and Public Works Chronicle*. Since then several different papers have been issued with varying success. *The Indian Engineer* is nicely got up and well printed, and, to judge by the first number, will prove to be an interesting journal, containing as it does many very good articles on general Indian engineering, civil and mechanical. We trust it will receive general support, and in time become an acknowledged organ of the profession in India.

WE are pleased to see from the current number of the *Agricultural Students' Gazette* that the authorities of the Royal Agricultural College, Cirencester, have provided greater facilities for teaching the increasingly important branch of agriculture, dairy farming. A new working dairy has been erected and fitted with appliances of the most improved kinds. We notice also that further substantial accommodation has been made for out-students. The *Gazette* contains a description of the new buildings and an account of the College live stock; the dairy herd contains specimens of nine breeds, and the specimen flock of fifteen different breeds. An article by Mr. J. M. Muir-McKenzie, on cultivation in the Western Ghâts, gives a description of the prevalent method of cultivation in this part of the Bombay Presidency, by means of wood ash and *râb*; this style of native agriculture entails the destruction of much jungle and denudation of the hills to the detriment of the low lands; it raises various difficulties between the natives and the forest and other officials, and any attempt to grasp its scientific and economic bearings is worth careful attention.

UNDER the title of "Malvern Field Hand-book and Naturalist's Calendar," Mr. G. E. Mackie, Assistant Master in Malvern College, has published a little volume that will be useful both to residents and visitors. The Hand-book was originally begun for the use of the boys of the Malvern College Field Club, but has been much enlarged.

MR. THOMAS WARDLE, of Leek, has been to India to examine the cultivation of the silkworm (*Bombyx mori*) there, and the methods still in use of reeling the silk. Although the reputation of Bengal silk has gone down greatly during the last twenty-five years, yet microscopical examination satisfied him that the fibre of the Indian silk was quite equal to that of Italian, and that improvement in the machinery and method of reeling was all that was required. The length of thread, however, in each cocoon was very different, the Indian worm only spinning 150 metres, while the more highly-tended and selected Italian worm produced 650 metres. It is suggested that the Government should rear a limited quantity of cocoons, from which a careful selection of "seed" only shall be made, since much of the present inferior quality is traceable to want of discretion in the choice of breeding stock. A loss to the growers of 60 per cent. of their grubs through hot winds can be prevented by the use of mud huts instead of matted walls only. The profitableness of the business is shown by the fact that the zemindars have been able to exact the highest of all agricultural rents for land where the mulberry is grown for this purpose: more than twelve times the amount paid for land adjoining planted with rice. But they do not realise that such high rents are not practicable now silk is at only half its ordinary price.

MR. FORTESCUE, the Superintendent of the Reading Room in the British Museum, has just produced a catalogue which is new, as far as the Museum is concerned, in plan, and which will prove of the utmost benefit to all students, men of science included. It is a catalogue of all the works acquired during the years 1880–85 in all modern languages except Oriental, Hungarian, and Sclavonic, arranged according to subjects. At present the alphabetical system is that employed in the Museum Catalogue, and therefore, unless the student knows, or can ascertain, the name of his author, the Library and its Catalogue are of no use to him. With Mr. Fortescue's Catalogue one can tell at a glance what books have been published during the past five years in any given subject, or branch of a subject, in Europe, America, or the British Colonies. The work contains about 1000 pages, with from 50,000 to 60,000 entries. An analysis of one or two headings will best show the value of the Catalogue. To take "Chemistry," under the sub-head "General" we find, first, all important text-books, then elementary works, both grouped under the different languages; then follow Agricultural, Analytical, Arithmetical, Bibliography, Examination Papers, Inorganic, Medical (with cross-references to Materia Medica and Pharmacy), and, finally, Organic, with about 400 entries in all. This, of course, does not exhaust the subject, for under such heads as Acids, Alkalies, Alkaloids, and so on, throughout the book, we have also the titles of chemical publications. The subject Electricity is a remarkable one for the number of entries under it. They fill ten pages in double columns, and about half refer to the electric light. It is curious to notice, too, that fifty telegraph codes were published in the five years included in the Catalogue; these do not, of course, include the innumerable private and cypher codes.

A UNITED STATES digest of the Report of the British Commissioners on Technical Education by an eminent pioneer in the work has been issued as a Circular of Information by the Bureau of Education. In the writer's earlier days "apprenticeship was rapidly disappearing and home manufactures were giving place to large mills and factories, and yet the schools in which the young were to be specially fitted for their career in the new order of industries were in a large measure limited to the old in methods and principles"—and far too little has there been any alteration since! The British Commissioners' Report is reprinted and added on to the text of this Circular, but the latter is chiefly an account of the French, German, and Russian technical schools, to the latter of which the writer gives the palm of excellence. In these schools, however, a great deal more than teaching is done. In St. Petersburg material is handled in the most wholesale style, and in Moscow orders for specially difficult work are taken and executed. Valuable, however, as such trained ability may be where trained ability is scarce, it is not a solution of the problem before England and America, where the object is to teach every youth the principles which underlie his work. The average age of youths who enter such institutions is over seventeen, and the course extends over five or six years. The result of much of such training in the advanced manufacturing countries must naturally be, as in Germany already, an overflow of highly-trained polytechnic students seeking something above an intelligent mechanic's work. A specially complete set of schools for teaching the various trades at Chemnitz is described. In France the work of such schools in providing a substitute for the extinct apprenticeship system is so efficient that, it is said, "the effort to avoid teaching trades will not be very successful," and they are found already to revive drooping industries and to make new ones. A most important observation, if generally borne out, is that much of this technical work can be added to, not substituted for, ordinary school work.

WE learn from *Naturen* that a committee has been formed at Christiania to promote the long-projected establishment of a zoological garden in the Norwegian capital. The plan suggested by the promoters of the scheme is wisely adapted to the special collection of North European and Arctic animals, such as the Polar bear, reindeer, elk, and the numerous other members of the Cervus family to be found in high latitudes, while no attempt will be made to introduce animal forms belonging to tropical faunas, whose susceptibility to cold makes it difficult to maintain them in health even in zoological stations lying far south of Norway.

WE are sorry to learn that bad weather greatly interfered with the success of Herr Stejneger's explorations of the Behring Straits fauna and flora during his last summer's boating voyage. At the extremity of Komandor Bay he believes that he has identified the exact spot at which Behring and his unfortunate comrades were shipwrecked, and where he perished from the effects of exposure in the winter of 1741. Here Herr Stejneger found buried beneath the soil various relics of this memorable expedition, including a thin brass plate stamped with the Russian double eagle. The search for plants and insects was specially unsatisfactory, for the damp mildewed the few specimens collected, and ruined all the cases and herbaria, while it so thoroughly rusted every fragment of steel and iron that all the instruments intended for meteorological and other observations were made useless.

THE additions to the Zoological Society's Gardens during the past week include two Military Macaws (*Ara militaris*), a Red and Yellow Macaw (*Ara chloroptera*) from South America, presented by Mr. C. Clifton, F.Z.S.; two Ring Doves (*Columba palumbus*), British, presented by Lord Arthur Russell, M.P., F.Z.S.; a Jay (*Garrulus glandarius*), British, presented by Mr. R. Humphries; two Spanish Terrapins (*Clemmys leprosa*) from Spain, a Spotted Salamander (*Salamandra maculosa*), a Fire-bellied Toad (*Bombinator igneus*), six Axolotls (*Siredon mexicanus*) from Mexico, a Green Lizard (*Lacerta viridis*), European, presented by Mr. Alban Doran, F.R.C.S.; twenty Palmated Newts (*Molge palmata*) from Epping Forest, presented by Mr. G. A. Boulenger, F.Z.S.; a Collection of Sea Anemones, from British Seas, presented by Mr. W. L. Sclater, F.Z.S.; two Ring-tailed Lemurs (*Lemur catta*) from Madagascar, an Asiatic Wild Ass (*Equus onager* ♂) from India, deposited; a Ludio Monkey (*Cercopithecus ludio*) from West Africa, three Red-crested Finches (*Coryphosphingus cristatus*) from South America, two Rosy-faced Love-Birds (*Agapornis roseicollis*) from South Africa, a Shining Parrakeet (*Pyrrhulopsis splendens*) from Fiji Islands, a Vinaceous Amazon (*Chrysotis vinacea*), a —— Conure (*Conurus* ——) from Brazil, two Short-eared Owls (*Asio brachyotus*), a Magellanic Eagle Owl (*Bubo magellanica*), a Pudu Deer (*Pudu humilis* ♀) from Chili, purchased; a Hairy-eared

Rhinoceros (*Rhinoceros lasiotus* ♂) from India, two Punjaub Wild Sheep (*Ovis cycloceros*) from North-West India, received in exchange.

OUR ASTRONOMICAL COLUMN

THE INFLUENCE OF PHASE ON THE BRIGHTNESS OF THE MINOR PLANETS.—Dr. G. Müller gives an interesting discussion in the *Astronomische Nachrichten*, Nos. 2724-2725, of the variations in brightness of seven of the minor planets. The determinations of the magnitudes of these objects were made by means of a photometer, on Zollner's principle, attached either to the Steinheil telescope of the Potsdam Observatory, of aperture 135 mm. aperture, or to the Grubb equatorial of 207 mm. aperture. The result of these observations seems to show that there is a real connection between the phase of these planets and their apparent brightness, and that Lambert's law of phase brightness does not apply to them. Dr. Müller further divides the planets he has observed into two classes. In the first class, which embraces Vesta, Iris, Massilia, and Amphitrite, the changes in brightness are only perceptible as the planet approaches opposition; in the second, which contains Ceres, Pallas, and Irene, the changes in brightness seem to be coextensive with the changes of phase. The planets of the first group thus correspond in their behaviour to the planet Mars, and Dr. Müller thinks we may fairly infer therefrom a similarity in their physical condition to that of the ruddy planet. The planets of the second class would appear, on the other hand, to give a light curve similar to that given by our moon, or rather perhaps by Mercury; it is therefore not improbable that they bear more resemblance in their physical constitution to that body.

COMET FABRY.—The following ephemeris by Dr. S. Oppenheim is taken from the *Astronomische Nachrichten*, No. 2722 :—

For Berlin Midnight

1886	R.A. h. m. s.	Decl. ° ′	Log *r*	Log Δ	Brightness
May 3	5 1 16	7 33·1 S.	9·9351	9·2358	381·4
5	6 16 8	22 59·4	9·9617	9·4446	195·2
11	7 3 53	30 30·4	9·9877	9·5698	97·3
15	7 34 43	34 18·8	0·0130	9·6758	53·2
19	7 55 56	36 29 6	0·0373	9·7632	31·8
23	8 11 35	37 53·6	0·0606	9·8364	20·4
27	8 23 52	38 53·2	0·0828	9·8992	13·8
31	8 34 0	39 39·2 S.	0·1041	9·9528	9·8

The brightness on 1885 December 1 is taken as unity.

BARNARD'S COMET.—The following ephemeris by Dr. H. Oppenheim (*Astr. Nachr.*, No. 2714) is in continuation of that given in NATURE for April 1, p. 518 :—

Ephemeris for Berlin Midnight

1886	R.A. h. m. s.	Decl. ° ′	Log *r*	Log Δ	Brightness
May 6	1 41 34	39 23·5 N.	9·6858	9·8894	155
10	1 50 59	36 42·5	9·7087	9·8125	199
14	2 8 29	31 42·6	9·7429	9·7266	253
18	2 35 41	23 16·9	9·7828	9·6374	318
22	3 13 3	10 16·3 N.	9·8242	9·5619	371
26	3 58 59	6 32·5 S.	9·8648	9·5291	359

The brightness on 1885 December 5 is taken as unity.

THE APPLICATION OF PHOTOGRAPHY TO ASTRONOMY.—In Appendix III. to the "Washington Observations for 1882," Prof. Harkness, U.S N., commenting on the difficulty of preventing the solar rays from disturbing the adjustments of a meridian instrument employed in observing the sun, points out that photography seems to afford an escape from the difficulty. He suggests that a transit-circle might be so constructed that its eye-piece could be readily removed, and a sensitive photographic plate inserted just behind its wire system. Then with the eye-piece in position stars can be observed, and the instrumental constants determined in the usual way; while at noon a photographic plate can be inserted, and an instantaneous exposure will suffice to give an image of the sun with the transit and declination wires of the instrument imprinted upon it. The position of the sun's centre relatively to these wires having been measured, this, together with the instrumental constants, the circle-reading and the sidereal time of exposure will give an exact determination of the sun's right ascension and declination. As the instruments will be exposed to the sun's rays only for a few thousandths of a second, no disturbance of its constants can, Prof. Harkness thinks, arise from that cause; and the results, in his opinion, would probably be superior in accuracy to any hitherto obtained by the usual methods.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1886 *MAY* 9-15

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on May 9

Sun rises, 4h. 20m.; souths, 11h. 56m. 16·3s.; sets, 19h. 33m.; decl. on meridian, 17° 25′ N.: Sidereal Time at Sunset, 10h. 43m.

Moon (at First Quarter on May 11) rises, 9h. 12m.; souths. 16h. 58m.; sets, 0h. 36m.*; decl. on meridian, 16° 37′ N.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian ° ′
Mercury ...	... 3 46 ...	10 19 ...	16 52 ...	5 51 N.
Venus ...	... 3 0 ...	9 4 ...	15 8 ...	0 0
Mars ...	... 12 40 ...	19 34 ...	2 28* ...	9 52 N.
Jupiter...	... 14 21 ...	20 39 ...	2 57* ...	2 50 N.
Saturn...	... 7 1 ...	15 13 ...	23 25 ...	22 50 N.

* Indicates that the setting is that of the following morning.

Occultation of Star by the Moon (visible at Greenwich)

May	Star	Mag.	Disap. h. m.	Reap. h. m.	Corresponding angles from vertex to right for inverted image ° °
15 ...	θ Virginis	... 4½ ...	2 42 ...	3 36 ...	93 309

May h.
13 ... 16 ... Jupiter in conjunction with and 0° 25′ north of the Moon.

Variable Stars

Star	R.A. h. m.	Decl. ° ′		h. m.	
ζ Geminorum ...	6 57·4 ...	20 44 N. ...	May 9,	21 30	*m*
			,, 14,	21 40	*M*
S Cancri	8 37·4 ..	19 27 N. ...	,, 12,	22 56	*m*
R Ursæ Majoris ...	10 36·6 ...	69 22 N. ...	,, 12,		*M*
δ Libræ	14 54·9 ...	8 4 S. ...	,, 9,	2 30	*m*
U Coronæ	15 13·6 ...	32 4 N. ...	,, 13,	21 17	*m*
R Draconis	16 32·4 ...	67 3 N. ...	,, 10,		*m*
U Ophiuchi	17 10·8 ...	1 20 N. ...	,, 10,	11 58	*m*
			and at intervals of	20 8	
X Sagittarii... ...	17 40·4 ...	27 47 S. ..	May 12,	2 20	*m*
			,, 15,	0 0	*M*
W Sagittarii ...	17 57·8 ...	29 35 S. ...	,, 11,	2 30	*m*
R Lyræ	18 51·9 ...	43 48 N. ...	,, 13,		*M*
T Aquarii	20 43·9 ...	5 34 S. ...	,, 15,		*m*
δ Cephei	22 24·9 ...	57 50 N. ...	,, 10,	21 30	*m*

M signifies maximum; *m* minimum.

Meteor Showers

Amongst the secondary radiants active at this time are the following:—From Lynx, R.A. 123°, Decl. 40° N.; near δ Libræ, R.A. 223°, Decl. 10° S.; from Delphinus, R.A. 304°, Decl. 7° N.; near ζ Cygni, R.A. 320°, Decl. 18° N.; near κ Andromedæ, R.A. 354°, Decl. 41° N.

BIOLOGICAL NOTES

THE HYMENOPTERA OF THE HAWAIIAN ISLANDS.—In the *Proceedings* of the Literary and Scientific Society of Manchester (vol. xxv. pp. 123-183) is a valuable contribution on the Hymenopterous insect-fauna of the Hawaiian Islands, by the Rev. T. Blackburn, B.A., who resided there for many years, with a short introduction and annotations by Mr. P. Cameron. Eighty-four species are catalogued or described, but Mr. Blackburn says he has taken over 100. The greater part of the species appear to be strictly autochthonous. Of the *Anthophila* (or bees) there are 14 species (excluding the introduced honey-bee), and it is curious that 10 of these belong to 1 genus—*Prosopis*. Of the *Fossores* there are 35 species, and here again there is a paucity of genera, for 19 are included in *Odynerus* and 11 in *Crabro*. Of *Heterogyna* (ants) are only 10 species; and about 25 species of the various parasitic and hyper-parasitic groups. No indication of any of the phytophagous forms occurs in the paper. Before Mr. Blackburn went to the Hawaiian Islands the insect-fauna was almost unknown, so far as what may be termed the